

Uses of Agent-Based Modelling in the framework of biodiversity conservation

Christophe Le Page, Raphaël Mathevet

Abstract

Ecological models are increasingly used to improve understanding of ecosystems and the dynamics of species that are threatened or exploited by humans. Modelling proves to be very useful for observing complex systems, both in revealing their attributes and in exposing the gaps in knowledge, as well as in helping to define areas of research or to design actions for conservation purposes. In this presentation, we will show that agent-based models (ABM) allow researchers to dig deep into a social-ecological system's complexity, taking into account factors such as spatial effects, changes in scale and individual behaviour. Several examples illustrate how ABMs contribute to biodiversity conservation either by modelling population dynamics in a heterogeneous and dynamic environment, or by modelling human–environment interactions. With computer simulations and/or role-playing games, ABMs can support participatory modelling approaches in which stakeholders involved in biodiversity management projects collectively construct and reflect together on land use and land planning scenarios. Lastly, we show how participatory modelling and role-playing game experiments can give rise to social learning and social change that any integrated conservation project may need.